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34 acres, and more space would make many improvements possible.

A very large increase of space, however, is not necessary. If the government departments concerned would allow the society to use another 20 or 30 acres of the park on lines similar to those suggested in the columns of *The Times* in July last, there would be ample space for the exhibition of animals on the most modern lines. It is impossible to combine satisfactorily an exhibition ground with a place for the breeding or recuperation of animals. For the convenience of visitors, and children especially, the total area of a zoological garden should not be too great; and, if animals are to be seen satisfactorily, they must not be placed in enclosures large enough to let them retreat from the public gaze. On the other hand, for breeding, acclimatization and the recuperation of animals at all out of health, large secluded areas away from the smoke and fumes of a great city are necessary. An ideal menagerie, whether placed in Regent's Park or at the Crystal Palace, should have also a much larger station in the country where visitors are not allowed.

The cost of installing the Zoological Gardens on a new site would be very great. Even if the provisions of the London Building Act could be got over, and the designs for new Zoological Gardens made simple and suitable with regard to structure and material, the total cost of installation, apart from the cost of the animals and the cost of the ground, would reach at least a quarter of a million pounds. Then there is the question of revenue. Regent's Park, it is true, has been rather passed by in the recent changes that have taken place in London passenger traffic; but even with this disadvantage the average annual gate-money now exceeds £20,000, while the income from the subscriptions of fellows approaches £10,000, and is increasing yearly. Access to the Crystal Palace has certainly been much improved, but it is still difficult to get there by rail, while the roads leading to it are among the most congested in London.

Finally, neither the proprietors of the Crystal Palace nor the Zoological Society of Lon-

don can consider the finances entirely from the point of view of a public menagerie. The Crystal Palace would require a large income to meet interest on capital and various expenses, and it would look for assistance from the revenue earned by the menagerie. In the case of the Zoological Society, the maintenance of a popular collection of living animals, although the chief source of revenue, is only a part of the duty of the society. The introduction of animals of interest only to naturalists, the encouragement and direct assistance of zoological exploration throughout the world, the maintenance of a magnificent zoological library, and holding of meetings for the discussion of technical zoological subjects, and the publication of memoirs containing the results of zoological investigation are an essential part of the operations of the society, and one very difficult to combine with a place of general popular entertainment.—*London Times*.

SCIENTIFIC NOTES AND NEWS

SIR JOSEPH DALTON HOOKER, the great English botanist, has died in his ninety-fifth year.

DR. GEORGE DAVIDSON, eminent for his contributions to geodesy, geography and astronomy, emeritus professor in the University of California, has died at the age of eighty-six years.

FUNERAL services of the late Surgeon-General Walter Wyman, U. S. Public Health and Marine Hospital Service, were held in St. Louis in the First Presbyterian Church on November 24. On December 3, there were memorial exercises in San Francisco. A special memorial number of the *Weekly Bulletin of the St. Louis Medical Society* is to be issued in memory of Dr. Wyman.

THE Nobel prizes were awarded by the King of Sweden on November 10. The three recipients in the sciences, Mme. Marie Curie, of the University of Paris; Professor Wilhelm Wien, of the University of Würzburg and Professor Allvar Gullstrand, of the University of Upsala, were present to receive them.

PROFESSOR JOHN HENRY COMSTOCK, head of

the department of entomology at Cornell University, has been elected an honorary fellow of the Entomological Society of London.

A PORTRAIT of Dr. John A. Wyeth will be presented to the gallery of presidents of the New York Academy of Medicine by subscription of members.

A PORTRAIT of Professor James Geikie, subscribed for by members of the Royal Scottish Geographical Society, was unveiled by the president at the meeting of the society on November 11. A replica of the portrait was presented to Mrs. Geikie.

MR. C. O. LAMPLAND, of the Lowell Observatory, has recently been elected an honorary member of the Sociedad Astronomico de Mexico and Mr. E. C. Slipper, of the same observatory, has received its medal for his planetary photographs. Dr. Lowell has been an honorary member and a medallist of the society for several years.

PROFESSOR HENRY M. HOWE, of the department of metallurgy, Columbia University, has been elected honorary member of the Cleveland Institution of Engineers, Great Britain.

MR. N. C. NELSON, instructor in anthropology in the University of California, has been appointed assistant curator in the department of anthropology in the American Museum of Natural History. He will assume his duties next June and give special attention to North American archeology.

PROFESSOR J. KÖNIG has retired as director of the agricultural experiment station at Münster, after 40 years of service and has been succeeded by Professor A. Börner, formerly vice-director.

NAVAL CONSTRUCTOR HOLDEN A. EVANS has resigned from the navy to become vice-president of a shipbuilding company.

PROFESSOR RICHARD T. ELY, head of the department of political economy of the University of Wisconsin, has been appointed to represent the United States on the international commission appointed to study government crop reporting in Europe and America, by the International Statistical Institute, recently

held at The Hague. Statisticians generally have long been dissatisfied with the character of crop reports, and the purpose of the commission is to bring about an accurate and uniform method of crop reporting in all countries.

PRESIDENT H. S. DRINKER and Professor J. W. Richards, of Lehigh University, were among the thirty-eight engineers who attended the recent meeting in Japan of the American Institute of Mining Engineers.

ASSOCIATE PROFESSOR CHARLES J. CHAMBERLAIN, of the department of botany of the University of Chicago, is at present doing research work in the far east. In the course of his investigations Professor Chamberlain will visit eastern and southern New Zealand, eastern and western Australia and southern and western Africa.

PROFESSOR WALTER B. CANNON, of Harvard Medical School, gives the sixth of the Harvey lectures at the New York Academy of Medicine on December 16, his subject being "A Consideration of the Nature of Hunger."

PROFESSOR ERIC DOOLITTLE delivered a lecture before the University of Pennsylvania Chapter of the Sigma Xi, on December 11, in the Randal Morgan Laboratory of Physics. His subject was "The Recent Discoveries in Stellar Astronomy."

THE memory of Benjamin Franklin, founder in 1740 of the University of Pennsylvania, is to be honored by the erection of a bronze statue at a cost of \$10,000, on the tenth anniversary of the class of 1904, college, in June, 1914. The statue will be placed in front of the gymnasium on Thirty-third Street, near Spruce. The statue will be of heroic proportions, and will represent Franklin as he first appeared in Philadelphia as a runaway printer's apprentice. It has been modeled by Dr. R. Tait McKenzie, professor of physical education, who has modeled several medallions for the university and figures of athletes which have attained celebrity for their lifelike postures. The base of the statue has been designed by Professor Henry Cret, of the architectural school.

IN memory of Mungo Park and Richard Lander, who explored the course of the river Niger, it is proposed to erect an obelisk of similar design and dimensions to Cleopatra's Needle, on a projecting point of land at Forcados.

PROFESSOR STÖHR, director of the Anatomical Institute at Würzburg, died on November 4, aged sixty-two years.

THE death is announced of Dr. F. Bente, director for many years of the control station for fertilizers, feeding stuffs, foods and seeds at Ebstorf, Prussia.

PROFESSOR ALFRED COLE, secretary of Section B, writes that at the annual meeting of the American Association for the Advancement of Science, at Washington, December 27-30, 1911, Section B (physics), will, as usual, hold joint sessions with the American Physical Society. The place of meeting will be at the Bureau of Standards. The ordinary program of papers will be in charge of the officers of the Physical Society, but the two sessions on Thursday, December 28, will be devoted to papers of more general scientific interest and will be in charge of Section B. At the forenoon session of that day the address of the president of the Physical Society, Professor W. F. Magie, will be given, the subject being "Primary Concepts of Physics." This will be followed by a symposium on "The Ether," led by Professor A. A. Michelson, who will be followed by Professor A. G. Webster, C. E. Mendenhall and others. At the afternoon session there will be the address by the retiring chairman of Section B, Professor E. B. Rosa, on "The Work of the Electrical Division of the Bureau of Standards"; a paper by Professor H. A. Wilson, of Montreal, on the "Structure of the Atom" and (probably) one by Dr. S. W. Stratton, on "Physical Work at the Bureau of Standards." Other addresses of special interest to physicists will be that of Professor A. L. Rotch before Section D on "Aerial Engineering" (unfortunately set for Thursday afternoon) and that of the retiring president of the American Association, Professor A. A.

Michelson, on "Recent Progress in Spectroscopic Methods," on Wednesday evening, December 27, at 8 p.m. The New Ebbitt House is selected as hotel headquarters for physicists. It is located at 14th and F Streets. Rates, European plan, \$1.50 without bath, \$2.00-\$2.50 with bath. At recent meetings the plan of getting together at one hotel has added much to the pleasure and profit of the meeting. It would be well to reserve hotel accommodation at once. Abstracts of papers to be presented should be sent as soon as possible to the secretary of the Physical Society, Professor Ernest Merritt, Cornell University, Ithaca, N. Y. The program of the meeting will be mailed on December 15. Except by special action of the program committee, no more than ten minutes can be allowed for the presentation of each paper. Attention is also directed to the council rule which *forbids the secretary to place a title upon the program until an abstract (not necessarily for publication) is in his hands.*

THE thirteenth meeting of the Astronomical and Astrophysical Society of America will be held at the Carnegie Institution, Washington, D. C., on Wednesday, Thursday and Friday, December 27-29, 1911. This particular time and place have been chosen for an extra meeting for the purpose of bringing the society both as individuals and as an organization into closer touch with the American Association for the Advancement of Science. A joint session with Section A of the American Association for the Advancement of Science has been arranged for Friday morning. The program of this session will include the address by the retiring chairman of Section A, Professor E. H. Moore; a paper on the "Asteroid Problem," by Reverend J. H. Metcalf, and probably, also, a paper by Professor Lewis Boss on his recent stellar researches. On Wednesday evening there will be a reception at the Naval Observatory tendered by the superintendent and staff to the officers and members of the society. On Thursday afternoon the members will visit the Astrophysical Observatory of the Smithsonian Institution.

THE dates for sessions of the American Physiological Society in Baltimore are December 26-29. The council meets in the evening, December 26, and the scientific sessions begin in the morning, December 27, and continue through the morning of December 29. The session in Washington in connection with Section K is planned for the afternoon of December 29. Arrangements are being made for a symposium on *Acapnia and Shock* for this joint session. The headquarters in Baltimore will be at the Hotel Rennert, corner of Liberty and Saratoga streets. Arrangements have been made by which members of the three societies (Physiological, Biochemical and Pharmacological) meeting in Baltimore may dine together at the headquarters on Wednesday and Thursday evenings, and it is proposed that on both evenings the dinner shall terminate in an informal smoker. The scientific sessions of the society will be held in the physiological building of the Johns Hopkins Medical School. Announcement of papers for the Baltimore sessions have been received from the following members: E. B. Meigs, D. E. Jackson, W. E. Garrey, Th. Hough, J. Erlanger, G. Lusk, H. Cushing and C. Jacobson, Y. Henderson, W. P. Lombard, W. Salant, J. A. E. Eyster, A. S. Loevenhart, L. B. Mendel, W. J. Osterhout, C. Brooks, J. J. R. Macleod, R. E. Sheldon, C. J. Wiggers, W. J. Meek, F. S. Lee and A. E. Guenther, F. S. Lee and M. Levine, E. M. Ewing and H. C. Jackson, H. McGuigan, C. W. Edmunds, G. W. Crile, G. W. MacCallum, J. Auer, S. A. Matthews.

THE third annual meeting of the Paleontological Society will be held in the New National Museum building, Washington, D. C., beginning on Thursday morning, December 28, at 10 o'clock. President William B. Scott will preside over the meeting. The program includes a conference on Friday on Ten Years' Progress in Vertebrate Paleontology with papers as follows:

Wm. B. Scott: South American Mammals.
W. D. Matthew: African Mammals.
O. A. Peterson: Artiodactyla.
J. W. Gidley: Perissodactyla.

W. D. Matthew: Carnivora and Rodentia.
W. K. Gregory: Primates, Marsupials and Insectivores.
F. W. True: Marine Mammals.
E. C. Case: Paleozoic Reptiles and Amphibia—a Comparison of Old and New World Forms.
W. J. Holland: Pre-cretaceous Dinosaurs.
R. S. Lull: Cretaceous Dinosaurs.
O. P. Hay: Chelonia.
J. C. Merriam: Marine Reptiles.
Bashford Dean: Paleozoic Fishes.
C. R. Eastman: Mesozoic and Cenozoic Fishes.
H. F. Osborn: Correlation and Paleogeography.
S. W. Williston: Evolutionary Evidence.
W. J. Sinclair: Contributions to Geologic Theory and Method.

Each of these papers is to discuss the following points: (a) status of our actual knowledge, and principal material in different museums which has been brought together in recent years; (b) theories accepted and rejected in recent years; (c) hypotheses on trial; (d) important investigations and explorations which should be made.

WE are requested by the chief of the Weather Bureau to announce that in connection with the Washington meeting of the American Association for the Advancement of Science an informal gathering of persons interested in meteorology and kindred subjects will be held at the Weather Bureau buildings, 24th and M streets, N. W., Thursday afternoon, December 28, from 5 to 7 p.m. The location is easy of access via the Pennsylvania Avenue car-line, by which many members of the association will be returning from the cavalry drill at Fort Myer, the same day. The drill is from 3 to 4:30 p.m. The proposed gathering will be analogous in character and purpose to the "meteorological luncheon" of the British Association, and its promoters hope that a meeting of this kind may become an annual event. A series of five-minute talks will be given by leading men of science on the general subject, "The Relation of Meteorology to other Sciences." The scope of the discussion will be broad enough to interest every one, and it is hoped that the attendance may be general on the part of members of the association and

their friends, including ladies. The visitors will be given an opportunity of inspecting the installations and work of the bureau.

THE annual meeting of the American Anthropological Association in affiliation with Section H of the American Association for the Advancement of Science and the American Folk-Lore Society will be held December 27-30 in Room 28, U. S. National Museum (new building), Washington, D. C., instead of in the Public Library as previously announced.

NEARLY a hundred students from the College of Engineering of the University of Wisconsin are now on their yearly tour of inspection of great engineering plants of the east. Engineering plants in Chicago, Milwaukee, Niagara Falls, Pittsburgh, Schenectady, N. Y., and New York City will be visited. These tours are required of students of engineering during their junior and senior years and are arranged to cover industries that illustrate the work of the course pursued by the student. Professors A. G. Christie, George J. Davis, J. R. Price and A. L. Goddard accompany the students on the trip.

A SITE for the Memorial Institute for Infectious Diseases, Chicago, to be built with funds bequeathed by Mrs. Annie W. Durand, has been selected and purchased at the corner of Wood and York Streets with a ground area of 100 by 126 feet. The building will be four stories and a basement in height and will cost with its equipment about \$200,000.

UNIVERSITY AND EDUCATIONAL NEWS

WILLIAMS COLLEGE will receive approximately \$100,000 by the will of Miss Sarah H. Pattison, of Ossining, N. Y. The money is to be used for the library.

THROOP POLYTECHNIC INSTITUTE, at Pasadena, California, through the generosity of an anonymous donor, has announced two annual prizes—a senior scholarship prize of \$750, to be used for a trip to Europe, and a freshman scholarship prize of \$250, to be used for a trip through some of the principal cities of the eastern United States. The senior prize will be awarded to the student who has the best

record in scholarship for the junior and senior year, "the faculty taking also into account, in assigning the award, considerations of deportment or good manners and ability for original work." The freshman prize will be awarded to the freshman who has the best scholarship record for the year, "good manners and the quality of initiative being also taken into account."

THE official list of changes in the instructing staff of the Massachusetts Institute of Technology shows that there have been forty-three replacements of last year's professors or instructors plus five additions, forty-eight new men. Chemistry and electric engineering are the departments in which the largest additions have been made. In chemistry the changes include the promotion of five instructors or assistants and the addition of six. In electrical engineering three additional instructors may be noted.

THE following appointments have been made at Cornell University: Herbert A. Hopper, assistant professor in extension work in animal industry; T. E. Schreiner, assistant in the department of poultry husbandry; G. H. Miller, assistant in pomology for the winter course; William C. Hooey, assistant in chemistry.

DR. M. T. COOK has resigned as plant pathologist in the Delaware Station to become professor of plant pathology in Rutgers College and plant pathologist in the New Jersey College Station.

MR. FRANK E. HERMANN has been made the head of the structural engineering department at the Stevens Institute of Technology.

AT Cornell University the work in farm management has been organized as a separate department, with G. F. Warren as head, K. C. Livermore as assistant professor and A. L. Thompson as instructor. The work in farm crops has been united with the department of farm practise and is in charge of Professor J. L. Stone.

MR. H. A. WADSWORTH has been appointed assistant professor of forestry in the school of forestry of the University of Idaho.